

- 3 -

Pierre S. Boudier
Appl. No. 09/903,504***Claims***

The listing of claims will replace all prior versions, and listings of claims in the application.

1. *(previously presented)* A system for optimization of a scene graph, comprising:
 - an optimization base comprising logic for at least one atomic optimization;
 - an optimization registry listing said at least one atomic optimization, and further listing parameter and priority information associated with said at least one atomic optimization;
 - an optimization manager for creating, configuring, and applying an optimization process to an input scene graph, wherein said optimization process comprises logic for an atomic optimization; and
 - an optimization configuration manager for accepting user configuration information to said optimization process, said user configuration information comprising selection of one or more of said at least one atomic optimization.
2. *(original)* The system of claim 1, further comprising a user interface through which a user can provide said user configuration information to said optimization configuration manager.
3. *(original)* The system of claim 2, wherein said user interface is provided to a user by a modeler that produces the scene graph to be optimized
4. *(cancelled)*
5. *(previously presented)* The system of claim 1, wherein said user configuration information comprises a specification of parameter values associated with said selected atomic optimization.

- 4 -

Pierre S. Boudier
Appl. No. 09/903,504

6. (original) The system of claim 1, wherein said at least one atomic optimization comprises a collapse geometry optimization.

7. (original) The system of claim 1, wherein said at least one atomic optimization comprises a collapse hierarchy optimization.

8. (original) The system of claim 1, wherein said at least one atomic optimization comprises a convert image optimization.

9. (original) The system of claim 1, wherein said at least one atomic optimization comprises a convert transform optimization.

10. (original) The system of claim 1, wherein said at least one atomic optimization comprises a create bounding boxes optimization.

11. (original) The system of claim 1, wherein said at least one atomic optimization comprises a flatten hierarchy optimization.

12. (original) The system of claim 1, wherein said at least one atomic optimization comprises a generate macro texture optimization.

13. (original) The system of claim 1, wherein said at least one atomic optimization comprises a normalize texture coordinates optimization.

14. (original) The system of claim 1, wherein said at least one atomic optimization comprises a promote attributes optimization.

15. (original) The system of claim 1, wherein said at least one atomic optimization comprises a remove attributes optimization.

- 5 -

Pierre S. Boudier
Appl. No. 09/903,504

16. (*original*) The system of claim 1, wherein said at least one atomic optimization comprises a resize image optimization.

17. (*original*) The system of claim 1, wherein said at least one atomic optimization comprises a share attributes optimization.

18. (*original*) The system of claim 1, wherein said at least one atomic optimization comprises a spatial partition optimization.

19. (*original*) The system of claim 1, wherein said at least one atomic optimization comprises a strip triangles optimization.

20. (*original*) The system of claim 1, wherein said at least one atomic optimization comprises a transform alpha optimization.

21. (*original*) The system of claim 1, wherein said at least one atomic optimization comprises a vertex blending optimization.

22. (*cancelled*)

23. (*previously presented*) A method of optimization of a scene graph, comprising the steps of:

- a. receiving an input scene graph;
- b. creating an optimization process; and
- c. applying the optimization process to the input scene graph

to create a scene graph optimized for at least one of

enhancement of traversal time,
enhancement of drawing time,
reduction of memory usage,
efficiency of data manipulation, and
targeting a specific rendering platform,

- 6 -

Pierre S. Boudier
Appl. No. 09/903,504

wherein said step b comprises the steps of:

- i. receiving user input identifying an atomic optimization and any associated parameters;
- ii. accessing the atomic optimization via an optimization registry;
- iii. incorporating the atomic optimization into the optimization process;
- iv. if the user input comprises parameters associated with the optimization, configuring the optimization process according to the parameters; and
- v. if the user input does not comprise parameters, configuring the optimization process according to default parameters.

24. *(original)* The method of claim 23, wherein the atomic optimization comprises a collapse geometry optimization.

25. *(original)* The method of claim 23, wherein the atomic optimization comprises a collapse hierarchy optimization.

26. *(original)* The method of claim 23, wherein the atomic optimization comprises a convert image optimization.

27. *(original)* The method of claim 23, wherein the atomic optimization comprises a convert transform optimization.

28. *(original)* The method of claim 23, wherein the atomic optimization comprises a create bounding boxes optimization.

29. *(original)* The method of claim 23, wherein the atomic optimization comprises a flatten hierarchy optimization.

- 7 -

Pierre S. Boudier
Appl. No. 09/903,504

30. (original) The method of claim 23, wherein the atomic optimization comprises a generate macro texture optimization.

31. (original) The method of claim 23, wherein the atomic optimization comprises a normalize texture coordinates optimization.

32. (original) The method of claim 23, wherein the atomic optimization comprises a promote attributes optimization.

33. (original) The method of claim 23, wherein the atomic optimization comprises a remove attributes optimization.

34. (original) The method of claim 23, wherein the atomic optimization comprises a resize image optimization.

35. (original) The method of claim 23, wherein the atomic optimization comprises a share attributes optimization.

36. (original) The method of claim 23, wherein the atomic optimization comprises a spatial partition optimization.

37. (original) The method of claim 23, wherein the atomic optimization comprises a strip triangles optimization.

38. (original) The method of claim 23, wherein the atomic optimization comprises a transform alpha optimization.

39. (original) The method of claim 23, wherein the atomic optimization comprises a vertex blending optimization.

- 8 -

Pierre S. Boudier
Appl. No. 09/903,504

40. (*previously presented*) The method of claim 23, further comprising the step of:

d. performing post optimization processing.

41. (*original*) The method of claim 40, wherein said step d comprises the steps of:

- i. performing validity checks on the optimized scene graph;
- ii. creating statistics based on the optimization process; and
- iii. outputting the statistics.

42. (*previously presented*) The method of claim 23, further comprising the step of:

d. outputting an optimized scene graph.

43. (*cancelled*)

44. (*previously presented*) A computer program product comprising a computer usable medium having computer readable program code means embodied in said medium for causing an application program to execute on a computer that optimizes a scene graph, said computer readable program code means comprising:

- a. computer readable program code means for causing the computer to receive an input scene graph;
- b. computer readable program code means for causing the computer to create an optimization process; and
- c. computer readable program code means for causing the computer to apply the optimization process to the input scene graph to create a scene graph optimized for at least one of
 - enhancement of traversal time,
 - enhancement of drawing time,
 - reduction of memory usage,
 - efficiency of data manipulation, and

- 9 -

Pierre S. Boudier
Appl. No. 09/903,504

targeting a specific rendering platform,

wherein said computer readable program code means b comprises:

- i. computer readable program code means for causing the computer to receive user input identifying an atomic optimization and any associated parameters;
- ii. computer readable program code means for causing the computer to access the atomic optimization via an optimization registry;
- iii. computer readable program code means for causing the computer to incorporate the atomic optimization into the optimization process;
- iv. computer readable program code means for causing the computer to configure the optimization process according to the parameters, if the user input comprises parameters associated with the optimization; and
- v. computer readable program code means for causing the computer to configure the optimization process according to default parameters, if the user input does not comprise parameters.

45. *(original)* The computer program product of claim 44, wherein the atomic optimization comprises a collapse geometry optimization.

46. *(original)* The computer program product of claim 44, wherein the atomic optimization comprises a collapse hierarchy optimization.

47. *(original)* The computer program product of claim 44, wherein the atomic optimization comprises a convert image optimization.

48. *(original)* The computer program product of claim 44, wherein the atomic optimization comprises a convert transform optimization.

49. *(original)* The computer program product of claim 44, wherein the atomic optimization comprises a create bounding boxes optimization.

- 10 -

Pierre S. Boudier
Appl. No. 09/903,504

50. *(original)* The computer program product of claim 44, wherein the atomic optimization comprises a flatten hierarchy optimization.

51. *(original)* The computer program product of claim 44, wherein the atomic optimization comprises a generate macro texture optimization.

52. *(original)* The computer program product of claim 44, wherein the atomic optimization comprises a normalize texture coordinates optimization.

53. *(original)* The computer program product of claim 44, wherein the atomic optimization comprises a promote attributes optimization.

54. *(original)* The computer program product of claim 44, wherein the atomic optimization comprises a remove attributes optimization.

55. *(original)* The computer program product of claim 44, wherein the atomic optimization comprises a resize image optimization.

56. *(original)* The computer program product of claim 44, wherein the atomic optimization comprises a share attributes optimization.

57. *(original)* The computer program product of claim 44, wherein the atomic optimization comprises a spatial partition optimization.

58. *(original)* The computer program product of claim 44, wherein the atomic optimization comprises a strip triangles optimization.

59. *(original)* The computer program product of claim 44, wherein the atomic optimization comprises a transform alpha optimization.

- 11 -

Pierre S. Boudier
Appl. No. 09/903,504

60. (*original*) The computer program product of claim 44, wherein the atomic optimization comprises a vertex blending optimization.

61. (*previously presented*) The computer program product of claim 44, further comprising:

d. computer readable program code means for causing the computer to perform post optimization processing.

62. (*original*) The computer program product of claim 61, wherein said computer readable program code means d comprises:

i. computer readable program code means for causing the computer to perform validity checks on the optimized scene graph;

ii. computer readable program code means for causing the computer to create statistics based on the optimization process; and

iii. computer readable program code means for causing the computer to output the statistics.

63. (*previously presented*) The computer program product of claim 44, further comprising:

d. computer readable program code means for causing the computer to output an optimized scene graph.